Hints

These are some hints or reminders of what you should include in your written report. They are list of important things that people sometimes forget to include, not an exhaustive list of what you should have in your report.

Nuclear

1. Are peaks consistent with what you expect from book values?
2. For Cs-137 are the Compton edge and backscatter peak where you would expect them to be? Show your calcualtions.
3. Range calculations. Need uncertainties and a discussion of how well each calculation (i.e. net vs gross) compares to the book value. Why would one be "better" than the other? You should discuss how your measurement differs from the "normal" way of measuring the range.

Thermal Radiation or Blackbody

1. Answer my questions AND the ones in Pasco's write up.

Be sure to include the following in your write up.

For Blackbody:

- Make the required measurements.
- Answer the Questions.
- Make the plot of "intensity" vs T^4 and use the Data Analysis routines to find the slope and its uncertainty.
- Also make a plot of "intensity" vs T. Can you tell whether it is linear? Which fits better, a T^4 curve or a linear T plot?
- Effect of putting Glass between the sensor and the cube/light.
- Intensity for different faces.
- Include your data tables!

For the $1/r^2$ law:

- Include your data tables.
- Briefly describe your set up. What measures did you take to eliminate stray or reflected light?
- Plot of Intensity vs. $1/r^2$. How well does it fit. (Do a regression analysis.)
- Plot Ln(Intensity) vs Ln(r). What is the slope? What should the slope be? Is the plot a straight line? (Do a regression analysis.)

Springs and Simple Harmonic Motion

1. I want you to estimate the accuracy of your spring constants for Method I. How much uncertainty did you have in your calculation of k?
2. For Method II – I want to see the uncertainties for both the k's and the effective mass of the spring. How did you calculate them?
3. How close are the k's from the different methods? Are they within $\pm 2\sigma$? (Here you want to see if $k_I - k_{II} = 0$. Find the standard deviation of the difference.)
4. How well does the model used to describe the oscillations of a massive spring work? Here you might compare the predicted period for 50g of added mass to the measured period for each model, i.e. massless vs. adding 1/3 the mass of the spring.

Dielectric Constant of Air (Interferometer)

1. It is important to show me how you get the uncertainty in Δm, number of fringe shifts, for a change in pressure of 1 atm. Since you are extrapolating, it involves the uncertainty in the slope and in the intercept. Remember, you are comparing $1 - n$ from your calculation to the book value of $1 - n$.
2. Find the uncertainty in your measured $n - 1$.
3. Make a plot of m vs ΔP for both lasers.

Photoelectric Effect and Half-life Measurement.

1. How close are you to the book value of Plank's Constant? I recommend you use units of eV•s for h.
2. What are the problems with the measurement technique, i.e. are you really measuring the stopping potential?
3. For the half-life measurements which one seems to be best, the 20s interval or the 40s one? (Why?)